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ABSTRACT

There is a clear national consensus that for the United States to remain economically competitive, schools will have to change to emphasize higher levels of performance and skills. Students need to be independent, directed, and effective learners to be able to adapt to changing work environments by acquiring and using new information. However, there is little consensus about how to operationalize these skills and assess them at different levels. Needed skills and competencies are grouped into four major categories: (1) basic skills; (2) higher-order thinking skills; (3) interpersonal and teamwork skills; and (4) personal characteristics and attitudes. A review of the literature suggests that schools have used a variety of strategies to improve these skills and competencies and that there is an increasing emphasis on integrating academic and vocational education. In practice, this has usually meant reforming vocational education, with little attention to college preparatory tracks. The meager research on these integration efforts suggests that success is site-specific, with identifiable features that center on providing time and resources. An appendix contains eight information sheets that summarize points from the review. (Contains 1 table and 34 references.) (SLD)

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ED 389 776

WORK FORCE PREPARATION:

A REVIEW OF LITERATURE

METROPOLITAN EDUCATIONAL RESEARCH CONSORTIUM

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Virginia Commonwealth University and the school divisions of Chesterfield, Colonial Heights, Hanover, Henrico, Hopewell and Richmond established the **Metropolitan Educational Research Consortium** (MERC) on August 29, 1991. The founding members created **MERC** to provide timely information to help resolve educational problems identified by practicing professional educators. **MERC** membership is open to all metropolitan-type school divisions. It currently provides services to 7,000 teachers and 120,000 students. **MERC** has base funding from its membership. Its study teams are composed of University investigators and practitioners from the membership.

MERC is organized to serve the interests of its members by providing tangible material support to enhance the practice of educational leadership and the improvement of teaching and learning in metropolitan educational settings. **MERC's** research and development agenda is built around four goals:

- To improve educational decision-making through joint development of practice-driven research questions, design and dissemination,
- To anticipate important educational issues and provide leadership in school improvement,
- To identify proven strategies for resolving instruction, management, policy and planning issues facing public education, and
- To enhance the dissemination of effective school practices.

In addition to conducting research as described above, **MERC** will conduct technical and issue seminars and publish reports and briefs on a variety of educational issues.

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WORK FORCE PREPARATION:

A REVIEW OF LITERATURE

Prepared by:

James H. McMillian
Virginia Commonwealth University
December 1993

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Executive Summary

For the past several years many different groups and organizations have conducted surveys and interviews of hundreds of business leaders concerning work force preparation. The clear consensus is that in order for America to remain economically competitive schools will need to change to emphasize higher levels of performance and skills. The need is for students to develop generic skills and competencies that will enable them to use decision-making, problem-solving, evaluative, and judgment cognitive skills in group settings. Students need to be independent, directed, and effective learners to be able to adapt to changing work environments by seeking, acquiring, and synthesizing new information.

While there is a general consensus about the broad categories of needed skills, there is little information about how to operationalize the skills and assess them at different levels. Needed skills and competencies can be grouped into four major categories: basic skills, higher-order thinking skills, interpersonal and teamwork skills, and personal characteristics and attitudes.

Schools have employed different strategies to improve these skills and competencies, including: teaching generic skills in all classes, increasing the number of academic courses in vocational education programs, increasing academic content in vocational courses, merging college preparatory and vocational education tracks into a single program for all students, tech prep, youth apprenticeship, and implementing more authentic assessment.

Initiated by the 1990 Amendments to the Carl D. Perkins Vocational Education Act of 1984, there has been an emphasis on "integrating" academic and vocational education. Integration as reform is characterized by an emphasis on generic skills, active learning with authentic problems, cooperation between academic and vocational teachers, and attention to school transition to college or work. In practice, integration has usually meant reforming vocational education, with little attention to college preparatory tracks.

What little research exists on integration suggests that success is site specific with the following features: implemented in all types of schools; viewed as a comprehensive school improvement program; given years to implement; integrated with systemic reforms; implemented from the school up, not top down; includes needed capacity-building resources; promotes vocational/academic teacher partnerships, involves parents and the business community, and promotes student understanding of the need for increased and new skills.

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Preface

In March 1993, the Metropolitan Educational Research Consortium (MERC) formed a study group to develop a research agenda in the area of workbound students. This document Work Force Preparation: A Review of the Literature represents the first step in identifying a series of research studies aimed at enhancing services for workbound students.

The review of literature summarizes recent research and writing on the preparation of students for the work force. The review is intended to clarify important issues and themes related to how high schools can better prepare students for the workplace, and to provide a basis for formulating research questions that can be pursued through the collection of additional information.

The review addresses the following research questions:

What is the nature of the concern about how schools are preparing students for the work force?

What are the skills and competencies needed by workbound students?

What is the relationship of educational processes to the characteristics of the workplace?

How can schools change to meet the challenge of improving work force skills?

What does it mean to "integrate" vocational and academic education?

What are some "lessons learned" from schools that have integrated vocational and academic education?

A study group was formed from MERC's membership to guide the research and disseminate its findings. They include: Dennis Wooldring, Chesterfield County Public Schools, Richmond, VA; Dr. Carole Urbansok-Eads and Glenith Whitaker, Hanover County Public Schools, Ashland, VA; Dewey T. Oakley, Jr. and Tommy Johnson, Henrico County Public Schools, Richmond, VA; Royce Hart, Hopewell Public Schools, Hopewell, VA; J. Austin Brown, Richmond City Public Schools, Richmond, VA.

Dr. James McMillan is leading the research team, which includes Ms. Mary Ann Wright, MERC research assistant, to work with the study group and conduct the research. Gwen Hipp, assisted the team and study group in meeting arrangements and document preparation.

John Pisapia
Director, MERC

WORK FORCE PREPARATION:

A REVIEW OF LITERATURE

The purpose of this review of literature is to summarize recent research and writing on the preparation of students for the work force. The review is intended to clarify important issues and themes related to how high schools can better prepare students for the workplace, and to provide a basis for formulating research questions that can be pursued through the collection of additional information. Particular emphasis is placed on literature that addresses the integration of vocational and academic tracks and courses. It is also hoped that the review will assist school divisions prepare proposals for funding apprenticeship and other related programs.

An annotated bibliography of all the sources used in this review is available.

The review is organized by important questions that address the major themes and issues in the literature.

What is the nature of the concern about how schools are preparing students for the work force?

Many different groups and organizations have conducted surveys and interviews of hundreds of corporate and business leaders concerning the level of knowledge and skills of entry-level workers. Whether the focus is on what is needed to enhance the economic competitiveness of American business or on the specific skills that students entering the work force should demonstrate, the **clear consensus** is that current high school **graduates lack** the high levels of skills needed by businesses and other organizations. Most sources point to **globalization** and the explosive growth of **technology** as primary conditions that require that we pay greater attention to how schools prepare students for work. There is also a need to increase overall **standards of performance** that will lead to greater **quality** in what we produce and deliver. Specifically, our schools have targeted relatively few resources toward the majority of students

who will enter the work force without a college degree. Workbound students who are trained in specific skills often face an extended period of casual work and unemployment. Vocational students usually lack the high levels of knowledge and skills needed for the changing economy and marketplace.

What are the skills and competencies needed by workbound students?

Several detailed sources provide an analysis of the skills and competencies needed by workbound students; the most cited source is the SCANS report published in 1991. The emphasis in SCANS and other literature is on **generic skills** that are needed across many occupations and industries by **all students**, not just those who choose not to attend college. The focus is on skills and competencies that will enable workers to use decision-making, problem-solving, evaluative, and judgment cognitive skills in group settings to function within evolving work settings. By developing generic skills workers will be able to adapt to changing environments and become independent, directed, and effective learners. More specifically, generic skills will enable workers to:

- cooperate and communicate for group/social problem solving
- identify and define problems in complex environments
- seek, acquire, and synthesize new information
- adapt to changes in information in the problem-solving environment

Table 1 summarizes, from two major sources, the skills and competencies that are needed by workers.

While there is general consensus about the broad categories of needed skills, there is relatively little information about how to operationalize the skills and assess them at different levels of performance.

Table 1: Summary of Needed Skills and Competencies

SCANS	ASTD (Carnevale)
BASIC SKILLS	
Basic Skills Foundation	Basic Competency Skills
Reading	Reading
Writing	Writing
Arithmetic/ Mathematics	Computation
Listening	Communication Skills
Speaking	Speaking
	Listening
HIGHER-ORDER THINKING SKILLS	
Thinking Skills	The Foundation
Creative Thinking	Learning How To Learn
Decision Making	
Problem Solving	
Seeing Things in Mind's Eye	Adaptability Skills
Knowing How To Learn	Problem Solving
	Thinking Creatively
INTERPERSONAL AND TEAMWORK SKILLS	
Interpersonal Competency	Group Effectiveness Skills
Participates as Member of a Group	Interpersonal Skills
Teaches Others New Skills	Teamwork
Serves Clients/Customers	Negotiation
Exercises Leadership	
Negotiates	Influencing Skills
Works With Diversity	Understanding Organizational Culture
	Sharing Leadership

4

PERSONAL CHARACTERISTICS AND ATTITUDES

Personal Qualities Foundation	Developmental Skills
Responsibility	Self-Esteem
Self-Esteem	Motivation and Goal Setting
Sociability	Career Development/ Planning
Self-Management	
Integrity/Honesty	

What is the relationship of educational processes to the characteristics of the workplace?

Traditionally, learning in many schools can be described as **passive**, **decontextualized**, and **fragmented**, with little transfer and an emphasis on getting the right answer. This type of environment may be adequate for developing workers who have narrowly defined jobs and tasks, who passively take orders, and who handle well-defined, nonambiguous situations that are independent of context. Increasing the "skill" of both students and workers in these environments focuses on increasing the number of stimuli for which correct responses are elicited, and socializing individuals to have little control over their own learning. Teachers are much like supervisors in a work setting - controlling, dispensing knowledge, and rewarding correct responses.

Restructured work environments and corresponding changes in the demands placed on workers will not be well served by traditional learning environments. The identification of needed skills and competencies clearly indicates a need to change traditional teaching/learning to develop individuals who will have **adaptable thinking skills** to function as an **active participant in solving problems** with others.

How can schools change to meet the challenge of improving work force skills?

There are several major approaches that schools have taken to improve work force skills. These approaches can be summarized as:

1. Teaching generic skills in all types of courses. This involves a restructuring at the classroom level to emphasize to a greater extent higher-order thinking skills, problem-solving skills, metacognitive skills, and so on. Such classrooms often include project-based learning, authentic problems, and cooperative teaming.

2. Integrating more academic courses into vocational programs. This approach involves requiring vocational education students to take a greater number of **higher level** academic courses. It is not sufficient to increase the number of low level courses. The key components to this approach are to (1) raise the academic course expectation level, and (2) emphasize **applied learning** in academic courses. Academic curriculum and standards are similar for all high school students; academic and vocational teachers work together to develop and implement applied learning.

3. Integrating more academics in vocational courses. In this approach vocational course content is changed to reflect more academic learning, e.g., increased emphasis on oral and written communication skills, higher level mathematics concepts, and science concepts.

4. Integrating college preparatory and vocational studies into a single program. This approach essentially merges vocational and academic tracks into a single program for all students, with different majors following an upgraded,

common core of academic courses that prepare all students for postsecondary education. Students are required to complete a vocational or academic concentration and college preparation. The "general track" is eliminated.

5. Tech Prep. This is a major initiative in vocational education that enables students to complete a "2+2" program by improving the transition from high school vocational programs into more advanced postsecondary programs in the same field. It requires coordinating course content, reducing duplication, and upgrading the status of some high school courses.

6. Youth apprenticeship. This is the newest and most ambitious approach for linking school and work. What is required is active participation of employers and an emphasis on integrating work-based and school-based learning. Apprenticeships should be structured to break down the barriers between academic and vocational programs, and should build bridges to postsecondary education. Successful programs require close and continuous collaboration between teachers and employers. Successful programs also include common generic skill learning objectives for all apprenticeships.

7. Implementing more authentic assessment to focus teaching on important generic skills.

What does it mean to "integrate" vocational and academic education?

The notion of integrating vocational and academic education, formalized in the 1990 Amendments to the Carl D. Perkins Vocational Education Act of 1984, means to organize the appropriate instructional and pedagogical practices into a single "integrated" experience to better prepare all students for the work force. However, the specific definition used by different groups may vary from this notion. The Perkins legislation characterizes integration

as a "a coherent sequence of courses," which is interpreted in many different ways. Despite differences in how integration is operationalized, four themes characterize integration as a reform: providing a richer, more coherent curricula that emphasizes generic skills; active learning in classrooms with authentic problems; coordination and cooperation between academic and vocational teachers; and more attention to school transition to college or work.

In practice, integration has usually meant reforming vocational education programs, for example, by adding more academic course requirements. However, any change that addresses the need identified by employers for improved work force preparation will likely affect all aspects of secondary education.

What are some "lessons learned" from schools that have integrated vocational and academic education?

There has been relatively little empirical research on either the process of integration or the results of integration in terms of student learning and performance. While successful strategies will vary from site to site, depending on the overall approach selected and characteristics of the school and community, there are some common features that are important:

1. **Integration can be implemented in <u>all</u> types of schools.** Research has demonstrated that all types of high schools and all types of students can benefit from appropriate integration. Federal efforts, however, focus on support for vocational schools and others receiving Perkins funding, and often state and local efforts mirror the federal approach.

2. **Integration is most effective when viewed as a comprehensive school improvement program.** Successful integration occurs when all aspects of the school environment and program (e.g., structure of the school day, staffing, curriculum, funding, counseling, etc.) are involved. It should not be viewed as

another "add on" to existing school practices. This suggests that appropriate fiscal and management resources exist to accomplish major changes. This includes clear support and commitment from the superintendent and school board.

3. **Successful integration takes years to implement.** It is important to recognize that integration cannot be accomplished quickly. It will take three to five years at a minimum to see positive results. Adequate time must be allocated for careful planning. Rushing integration risks teacher resentment and unrealistic expectations. It takes several years for teachers to become comfortable with changes.

4. **Successful integration is integrated with systemic reforms.** Integration can be effectively introduced along with other educational reforms such as site-based management, increased teacher professionalism and participation in decision-making, magnet schools, and authentic assessment. It is helpful to remove or relax regulatory requirements, and to give teachers more responsibility for determining curriculum and other instructional practices.

5. **Integration is most effective when it is school-specific and not top-down.** It is important for integration to take into account site-specific conditions and constraints. A top-down, standardized approach or set of directives mitigates needed teacher ownership and commitment.

6. **Integration requires capacity-building investments.** Full financial support is needed for staff development and collaboration. Important capacity-building activities include teaming, summer workshops, joint planning periods, observation periods, and opportunities for professional development. The emphasis should be on teachers, supporting them to change their teaching, master new curricula, and collaborate with each other. Partnerships with testing

firms, businesses, publishers, and higher education institutions help provide needed resources. Investments in capacity-building should be long-term.

7. **Students need to see the relationship between integrated programs and success in college and the workplace.** One of the keys to successful integration is helping students understand that it is important for them to upgrade their skills and knowledge. This understanding is facilitated by students' direct experiences with employers and colleges.

8. **Successful integration involves parents and the business community.** It is important to keep parents informed and to involve both parents and businesses in the development, implementation, and evaluation of integrated programs. One effective approach is to designate this responsibility to one person who can coordinate such efforts as orientation sessions, letters, and news articles.

9. **Vocational and academic teachers need to form partnerships.** Both vocational and academic teachers bring strengths that, together, form a strong foundation for effective integration. Academic teachers contribute higher levels of basic skills; vocational teachers put skills in the context of a job or career; both bring needed perspectives on higher level thinking skills. Many academic teachers are out of touch with the demands of the workplace, while vocational teachers may be insensitive to the need for higher levels of fundamental skills knowledge. As vocational and academic teachers begin meaningful communication and plan integration, teacher attitudes, focus, and commitment improve.

ANNOTATED BIBLIOGRAPHY

The purpose of this annotated bibliography is to summarize important recent literature that pertains to work force preparation, integrated high school curricula, and apprenticeships. It has been prepared for the Workbound Study Team of the Metropolitan Educational Research Consortium to provide a context for proposing a research study of workbound students.

Each source is on file at the Metropolitan Educational Research Consortium office at Virginia Commonwealth University, and all are available to members of the consortium.

An assessment of American education: The view of employers, higher educators, the public, recent students, and their parents. (1991). New York: Louis Harris & Associates, Inc.

This is a large-scale national study of the quality of education in relation to preparing all students for work or higher education. Employers, recent students, higher education officials, and other adults were surveyed. The survey identified 15 "key attributes" to either enter higher education or the work force, and respondents indicated on scales their perception of how well students were prepared in each area. The 15 attributes included working cooperatively, desire to learn, good attitudes in dealing with others, dress and behavior, ability to read, capacity to concentrate over extended time periods, motivation, mathematical ability, work ethic, writing, problem-solving. The results indicate significant concern that students are not well prepared in these areas.

Bailey, T. (1993). Can youth apprenticeship thrive in the United States? and Youth Apprenticeship in the context of broad education reform. Educational Researcher, 22, 4-10 and 16-17.

The first article reviews the arguments for implementing more apprenticeships and suggests criteria for successful programs. In the second article Bailey suggests reform actions that could help implement more effective apprenticeships.

Berryman, S. E. (1993). Learning in the workplace. In L. Darling-Hammond (Ed.), Review of research in education, Washington, DC: American Educational Research Association.

This chapter is a current and comprehensive review of "generic" knowledge and skills required across many occupations and industries for all students, not just those entering

the work force directly from high school. Using many different sources it is concluded that required skills are indeed changing. Higher levels of basic skills are needed, as are higher level thinking skills; learning skills are needed; teamwork abilities and other interpersonal skills are essential. Much specificity is needed to translate needed skills into curricular and pedagogical changes, shifting learning from limited transfer and passivity to transfer of general skills and active engagement.

Bodilly, S., Ramsey, K., Stasz, C., & Eden, R. (1993). Integrating academic and vocational education: Lessons from eight early innovators. Santa Monica, CA: RAND.

This study explores the practices and policies that define reform efforts aimed at integrating academic and vocational education by describing the experiences of eight high schools. A case study approach was used. Keys to successful transition efforts included involvement of external actors and curricular reforms that made schooling more resemble adult work. Among the lessons learned: Integration is best approached as a school reform/ restructuring/ improvement/ systemic reform efforts; it takes years to complete; it is easier in a conducive regulatory environment; it needs appropriate and sustained capacity-building investments. Analyses of the data showed that the eight sites could be clustered into three types or approaches to integration.

Bottoms, G., Presson, A., & Johnson, M. (1992). Making high schools work: Through integration of academic and vocational education. Atlanta: Southern Regional Education Board.

This book traces the SREB *High Schools That Work* program from its inception to current findings. The discussion represents the views of many educators who have been involved in upgrading the education of general and vocational track high school students. Tech prep programs are reviewed. Suggestions are made for raising expectations, making academic learning real, integrating academic content into vocational courses, academic and vocational teacher cooperation, developing a challenging program of study, and improving counseling to students.

Chandler, C. E. (1992). Bridging the literacy gap: An employer's Guide. Washington, DC: Center for Work Force Preparation and Quality Education, U.S. Chamber of Commerce.

This short document provides business leaders with the tools needed to establish workplace adult literacy programs. Suggestions are made to establish and implement a literacy program, with examples provided from several businesses.

Carnevale, A. P. (1991). America and the new economy. San Francisco: Jossey-Bass Publishers.

This book summarizes current and emerging economic realities of the American workplace. Technological and other changes are discussed in relation to their impact on the economy and the nature of standards successful businesses must meet. Included in the book is a list of 16 job skills that are required of workers to enable business success. These include both cognitive and affective foundation skills, academic basics, communication, problem solving and creativity, developmental skills, group effectiveness skills, and influencing skills.

Carnevale, A. P., Gainer, L. J., & Meltzer, A. S. (1990). Workplace basics: The essential skills employers want. San Francisco: Jossey-Bass Publishers.

This book details the findings of a three-year nation-wide study on the essential skills needed by the changing work force. The study represents a comprehensive effort to identify not only the skills but standards and implications for training. An entire chapter is devoted to each of the sixteen skills. The study revealed that in addition to previously identified "basics" (reading, writing, mathematics, and problem solving), employers cited the need for workers to have group effectiveness and other skills.

Carnevale, A. P., Gainer, L. J., & Meltzer, A. S. (1990). Workplace basics training manual. San Francisco: Jossey-Bass Publishers.

This manual provides a step-by-step guide to establish and implement a basic skills training program. The sixteen "essential skills" employers want are reviewed and a model is presented for how a training program could be organized and implemented. Included are specific suggestions for curriculum, exercises, and sample forms.

Craftsmanship 2000: A work based learning project. (1992). Tulsa, OK: Metropolitan Tulsa Chamber of Commerce.

These materials summarize the efforts of the Tulsa schools and corporations to develop and implement a comprehensive apprenticeship program to train skilled craftsmen for industry.

Developing SCANS assessment measures: Technical report. (1992). Iowa City, Iowa: American College Testing. Using the SCANS report as a foundation for essential employability skills, ACT outlines how it can respond to the need to develop measures of the skills.

Finegold, D. (1993). Making apprenticeships work. Santa Monica, CA: RAND Issue Paper.

This brief paper reviews three criteria to critique existing apprenticeship ideas and proposes and alternative youth-training program. The criteria include (1) the need to upgrade the prestige of apprenticeships so that it is not identified as a program for only those who do not go to college; (2) providing sufficient funds to ensure a high-quality experience; and (3) to be careful not to try to copy Germany's system.

Fort Worth: Project C3: Identification of workplace skills. (1992).Fort Worth, TX: Fort Worth Public Schools.

This report is the result of a survey of 3,500 employees and 300 companies and organizations in Fort Worth that analyzed 791 jobs and determined level of proficiency required to perform specific job tasks in seven areas (reading, mathematics, writing, speaking and listening, computer literacy, reasoning and problem-solving, and originality and creativity).

Fort Worth: Project C3: Transforming our schools. (1991). Fort Worth, TX: Fort Worth Public Schools.

This booklet and accompanying documents summarize a cooperative project between business, higher education, and community to motivate and prepare students for the workplace. Several projects are summarized, including vocational education initiatives, a student internship program, and a portfolio project.

Hamilton, M. A., & Hamilton, S. F. (1993). Toward a youth apprenticeship program: A progress report from the youth apprenticeship demonstration project in Broome county, New York. Ithaca, NY: Cornell University.

This publication summarizes current efforts of the Cornell program to implement an apprenticeship program derived from German models. It describes the needed infrastructure for the program, objectives, curriculum, and examples of some of the forty students involved.

Hamilton, S. F. (1993). Prospects for an American-style youth apprenticeship system. Educational Researcher, 22, 11-16.

The author advocates a comprehensive apprenticeship system that involves employer involvement, learning at the work site, and equity.

House joint resolution no. 143: Study of preparing a skilled work force. (1992). Richmond, VA: Virginia Department of Education.

This document summarizes the results of a joint DOE and SCHEV study on the efficacy of state public education in preparing a skilled work force for the 21st century. Focused on complex manufacturing to identify a model for researching other areas, the study identified critical competencies that must be developed. Recommendations are made to facilitate the development of these competencies.

Investment in the future. (1990, May). Presented to the Chesterfield County School Board, Chesterfield County, VA.

This is a summary of a 1989-90 study to determine the future direction and format for vocational education in the Chesterfield County Public Schools. Initiatives are identified to restructure vocational education to meet higher level skills, integrate academics, raise expectations, improve assessment and career development, and change curriculum and equipment.

Johnson, A. A., & Linden, F. (1992). Availability of a quality work force. New York: The Conference Board, Inc.

This report summarizes the results of more than 400 interviews with senior human resource executives about how their companies are planning to respond to changes in the labor force. Half of the high school graduates interviewed do not qualify for entry-level positions. Shortages exist in filling technical and skilled-labor positions.

Kazis, R. (1993). Improving the transition from school to work in the United States. Washington, DC: American Youth Policy Forum.

This report begins with a clarification and description of aspects of the school-to-work transition problem that need "fixing." Trends in program and policy innovation are identified, and a set of policy propositions for the country are summarized. In-school and work-based programs are described, including apprenticeships.

Labor force 2000: Corporate America responds. (1989). Chicago: Allstate Forum on Public Issues.

A task force of hundreds of major U.S. corporations formulated recommendations summarized in this report. Stressing the need for business, education, and community partnerships, it was concluded that there is a need for workers who can think creatively and respond intelligently to changing situations. The report identifies needed employment skills, categorized as academic skills or behavioral characteristics, and summarizes strategies for involving corporations in making needed changes.

McMillan, J. H. (1993). Student assessment in Richmond City schools: Business and government connections. Richmond, VA: Metropolitan Educational Research Consortium.

This report summarizes a series of nominal group interviews of Richmond area businesses that were undertaken to identify important work force competencies. National and state initiatives are reviewed in the context of testing programs in Richmond City Schools to determine the extent to which important work force skills are currently assessed.

Michigan employability skills. (1992). Lansing, MI: Michigan Department of Education.

This report summarizes important academic, personal management, and teamwork skills that are important to an effectively educated work force.

Oakes, J., Selvin, M., Karoly, L., & Guiton, G. (1992). Educational matchmaking: Academic and vocational tracking in comprehensive high schools. Santa Monica, CA: RAND.

This report is a detailed summary of a study of three comprehensive high schools to understand the rationale and processes that underlie course offerings and students' course taking as related to vocational education. Results suggest that curriculum decisions centered almost exclusively on the schools' academic offerings; decisions about vocational offerings and placements clearly took a "back seat." The findings were used to suggest how the culture of the high schools may pose challenges for integrating academic and vocational topics, skills, and staff.

O'Neil, H. F., Jr., Allred, K., & Baker, E. L. (1992). Measurement of work force readiness: Review of theoretical frameworks Los Angeles: National Center for Research on Evaluation, Standards, and Student Testing.

This report summarizes five studies that identified skills necessary for the work force and compares the frameworks to identify common elements. Also, two prototype measures are related to the findings common to the five studies, one in problem solving skills and one in negotiation/conflict resolution.

O'Neil, H. F., Jr., Allred, K., & Baker, E. L. (1992). Measurement of work force readiness competencies: Design of prototype measures. Los Angeles: National Center for Research on Evaluation, Standards, and Student Testing.

A fourteen step process is reviewed for creating and validating measures of work force readiness. Cognitive requirements of several SCANS skills are summarized, including item-writing specifications.

Philipsen, M., & Noblit, G. (in press), Tricky business: Corporate conceptions of educational reform. The High School Journal.

This paper summarizes the history of corporate involvement in education and analyzes corporate conceptions of educational reform. It is concluded that business-like approaches to educational reform will be counter-productive.

Saterfiel, T. H. (1993, April). Work keys: Strengthening the school-to-work transition. Paper presented at the meeting of the National Council on Measurement in Education, Atlanta, GA.

This paper describes the Work Keys assessments. These assessments are being developed by the American College Testing company and will include tests of generic work force skills in applied mathematics, listening and writing, reading for information, teamwork, applied technology, and locating information.

Stasz, C., Ramsey, K., Eden, R., DaVanzo, J., Farris, H., & Lewis, M. (1993). Classrooms that work: Teaching generic skills in academic and vocational settings. Santa Monica, CA: RAND.

This report summarizes a study of teaching generic work force skills in both academic and vocational classrooms. The results include a model that informs the design and conduct of courses that teach these skills. The results suggest that generic skills can be taught in both vocational and academic classrooms, that situated, authentic learning improves student engagement, and that a focus on generic skills helps to integrate academic and vocational education.

State initiatives for school and the workplace. (1991). Washington, DC: Council of Chief State School Officers.

This is a resource compendium of state initiatives to improve school and workplace learning. This includes initiatives to improve the connection between school and employment, to ensure student readiness for high-performance employment opportunities and lifelong, higher-order learning, and to provide types of restructured learning environments curricula, and appropriately trained staff to realize these goals. CCSSO calls for a restructuring of secondary schooling to achieve a highly skilled work force.

Vansickle, T. R. (1993, April). Work keys: Issues of validity for education and business applications. In T. H. Saterfiel (Chair), Work keys: Criterion related assessment can support the transition from school to work. Symposium presented at the annual meeting of the National Council on Measurement in Education, Atlanta, GA.

This paper describes efforts by ACT to validate Work Keys, assessments of generic work force skills. Criterion-related and content-related evidence are emphasized, along with job profiling.

What work requires of schools: A SCANS report for America 2000. (1991). Washington, DC: US Department of Labor.

A landmark report from the Secretary of Labor and Secretary's Commission on Achieving Necessary Skills that outlines new competencies high school students need to demonstrate to perform at high levels in the workplace. Five competencies are identified: resources, interpersonal, information, systems, and technology; and three oundation areas: basic skills, thinking skills, and personal qualities.

Wirth, A. G. (1993). Education and work: The choices we face. Phi Delta Kappan, 75, 361-366.

This article reviews important changes in our post-industrial society and the implications of these changes for work force preparation and education.

Wirth, A. G. (1992). Education and work for the year 2000: Choices we face. San Francisco: Jossey-Bass Publishers.

In this book Wirth reviews the evidence which suggests that we are confronted with revolutionary technological and economic changes that demands new educational standards for preparing students for work. There is a need for a better-educated, flexible work force capable of continuous learning. Additional chapters cover such topics as testing, restructuring, computers, and vocational education. Throughout the argument is made that we must educate our students for different types of thinking, disciplined effort, an appreciation of the importance of quality, and the ability to collaborate with others.

APPENDIX A

Integrating Academic and Vocational Education: Lessons Learned

- Implement in all types of schools
- Implement as part of a comprehensive school improvement program
- Implement over several years
- Integrate with systemic reforms
- Implement from schools up, not top down
- Include sufficient capacity-building resources
- Include students, parents, and the business community
- Implement academic/vocational teacher partnerships

Needed Skills and Competencies

- generic skills for all students
- decision-making, problem-solving, judgment cognitive skills
- cooperate and communicate for group problem-solving
- identify and define problems in complex settings
- seek, acquire, and synthesize new information
- adaptable to changing environments
- independent, directed, and effective learners

Educational Processes and the Workplace

CURRENT:

- passive
- decontextualized
- fragmented
- teachers controlling
- dispensing knowledge
- rewarding correct responses

NEEDED:

- active learning
- authentic problems
- adaptable thinking skills

Strategies to Improve Workforce Skills

- teaching generic skills in all classes
- requiring more academic courses in vocational education
- integrating more academics in vocational courses
- merging academic and vocational tracks
- tech prep
- apprenticeships
- authentic assessment

Basic Skills

SCANS

BASIC SKILLS FOUNDATION

- Reading
- Writing
- Arithmetic/ Mathematics
- Listening
- Speaking

ASTD

BASIC COMPETENCY SKILLS

- Reading
- Writing
- Computation

COMMMUNICATION SKILLS

- Speaking
- Listening

Higher-Order Thinking Skills

SCANS

THINKING SKILLS

Creative Thinking
Decision Making
Problem Solving
Seeing Things in Mind's Eye
Knowing How to Learn

ASTD

THE FOUNDATION

Learning How to Learn

ADAPTABILITY SKILLS

Problem Solving
Thinking Creatively

Interpersonal and Teamwork Skills

SCANS

INTERPERSONAL COMPETENCY

Participates as Member of a Group
Teaches Others New Skills
Serves Clients/Customers
Exercises Leadership
Negotiates
Works with Diversity

ASTD

GROUP EFFECTIVENESS SKILLS

Interpersonal Skills
Teamwork
Negotiation

INFLUENCING SKILLS

Understanding Organizational Culture
Sharing Leadership

Personal Characteristics and Attitudes

SCANS

PERSONAL QUALITIES FOUNDATION

- Responsibility
- Self-Esteem
- Sociability
- Self-Management
- Integrity/Honesty

ASTD

DEVELOPMENTAL SKILLS

- Self-Esteem
- Motivation and Goal Setting
- Career Development/ Planning